

OPTICAL FILTER AND METHOD OF MANUFACTURING THEREOF

Abstract

Novel structure of the optical elements (here filter) to be operated in the long, mid, and near infrared wavelengths of lights are provided. The filter can offer very narrow linewidth, and high reflectivity (transmissivity) at the peak wavelength. The optical element consists of the substrate, first diffraction grating and single uniform surface, and the second grating. Alternatively, the optical element again consists of the substrate, single uniform surface and the diffraction grating on the top of it. Alternatively, filter may consist of the number of sequence of layers, wherein each sequence comprises the single uniform layer sandwiched by the two diffraction grating layers. Filter again alternatively consists of the number of sequences wherein each sequence comprises the single uniform layer and the single diffraction grating. Diffraction grating may be two-step grating or multilevel grating with synchronously or nonsynchronously samples diffraction gratings. The optical element provided in this invention, could be used in the astronomical observatory instrument, chemical agent detection

system, and also in the military surface where the surface is needed to be made reflective or transmissive type at the predetermined wavelength of light irradiation. Again, this optical element can also be used in the free-space laser communication where, the mid to longer wavelengths of light is used as the transmitter source. The technique provided in this invention can help to design the longer infrared filter thinner using of the available material systems, offering the very narrow linewidth, and high reflectivity (or transmissivity) at the peak wavelength of light. Other advantage of this invention is that conventional IC technology can be used to fabricate the filter herein described.